

U.S. Application. No.: 10/009,347

I. CLAIM AMENDMENTS

1. (Currently Amended) A method of modifying the biological and/or physicochemical properties of a biological element, said method comprising reacting said biological element with a synthetic hydrophilic multivalent polymer having multiple reactive groups so that wherein the biological element is linked to the polymer by a plurality of linkages and ~~is thereby modified such as to change or modify said biological and/or physicochemical properties thereof.~~

2. (Currently Amended) A method as claimed in ~~Claim 1~~ claim 1 wherein the biological element is a viral vector containing therapeutic genetic material.

3. (Currently Amended) A method as claimed in ~~Claim 1 or 2~~ claim 2 wherein the biological element is an infectious agent such as a virus that normally targets and interacts with particular sites or receptors in a host, ~~characterised in that wherein~~ the polymer modification has the effect of modifying the infectivity of the biological element and/or retargeting it to a new or different site or receptor in the host.

4. (Currently Amended) A method as claimed in ~~Claim 2 or 3~~ claim 3 wherein re-targeting is achieved by incorporating a specific targeting group or moiety in the multivalent polymer and by ensuring that after modification[,] the biological element is sufficiently coated with the polymer as to inhibit targeting and interaction with the original target site or receptor of the host.

5. (Currently Amended) A method as claimed in ~~Claim 1~~ claim 1 which has the effect of modifying the solubility or partition co-efficient characteristics of the biological element in non-aqueous media by virtue of a hydrophobic group incorporated in the polymer.

6. (Currently Amended) A polymer modified biological element in which the biological element is covalently linked to a synthetic hydrophilic multivalent polymer having multiple reactive groups such that wherein said polymer is linked to the biological element by at least two covalent linkages and ~~whereby biological and/or physicochemical properties of said biological element are modified.~~

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7. (Currently Amended) A polymer modified biological element according to ~~Claim 6~~ claim 6 wherein the biological element includes therapeutic genetic material.

8. (Currently Amended) A polymer modified biological element according to ~~Claim 6~~ claim 6 wherein the number of linkages between the polymer and the biological element is greater than three.

9. (Currently Amended) A polymer modified biological element according to ~~any one of Claims 6 to 8~~ claim 8 wherein the linkage of ~~the said~~ polymer to the biological element and modification of the latter results in the inhibition of the ability of the biological element to interact in a host biological system with other molecules with which it would otherwise normally interact or in the inhibition of the ability of the biological element to bind to sites or receptors to which it would otherwise normally bind.

10. (Currently Amended) A polymer modified biological element according to ~~any one of Claims 6 to 9~~ claim 9 wherein polymer is a biologically inert multivalent polymer having a backbone which is substituted by one or more said reactive groups.

11. (Currently Amended) A polymer modified biological element according to ~~Claim 10~~ claim 10 wherein each of the reactive groups is connected to the polymer backbone either directly or via a spacer group.

12. (Currently Amended) A polymer modified biological element according to ~~Claim 10 or 11~~ claim 11 wherein the polymer backbone is based upon monomer units such as N-2- hydroxypropylmethacrylamide (HPMA), N-(2-HYDROXYETHYL)-1-GLUTAMINE (HEG), or ethyleneglycol-oligopeptide.

13. (Currently Amended) A polymer modified biological element according to ~~any one of Claims 6 to 12~~ claim 12 wherein the polymer and/or the linkages between it and the biological element are hydrolytically or enzymatically degradable.

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14. (Currently Amended) A polymer modified biological element according to ~~any one of Claims 6 to 13~~ claim 13 wherein the polymer used to modify the biological element is cross-linked such that it forms a hydrogel.

15. (Currently Amended) A polymer modified biological element according to ~~any one of Claims 6 to 14~~ claim 14 wherein a biologically active agent is coupled to or included in the polymer.

16. (Currently Amended) A polymer modified biological element according to ~~Claim 15~~ claim 15 wherein the biologically active agent is one or more of the following: a growth factor or cytokine, a sugar, a hormone, a lipid, a phospholipid, a fat, an apolipoprotein, a cell adhesion promoter, an enzyme, a toxin, a peptide, a glycoprotein, a serum protein, a vitamin, a mineral, ~~and/or~~ and an antibody recognising receptor.

17. (Currently Amended) A polymer modified biological element according to ~~Claim 16~~ claim 16 wherein the biologically active agent is an antibody or antibody fragment.

18. (Currently Amended) A polymer modified biological element as claimed in ~~any one of Claims 6 to 17~~ claim 17 wherein the biological element is a virus or other infective micro-organism and wherein the polymer is effective to bring about substantially a complete loss of the infectivity of the unmodified biological element.

19. (Currently Amended) A polymer modified biological element as claimed in ~~any one of Claims 6 to 18~~ claim 18 wherein the modification of the biological element has the effect of retargeting the biological element to different receptors in a biological host.

20. (Currently Amended) A polymer modified biological element as claimed in ~~any one of Claims 6 to 17~~ claim 17 wherein the modification of the biological element has the effect of modifying the solubility and dispersal and stability characteristics of the biological element within a non-aqueous environment.

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21. (Currently Amended) A polymer modified biological element as claimed in ~~Claim 20~~ claim 20 wherein the biological element is a micro-organism having oil degradative activity.

22. (Currently Amended) A polymer modified biological element as claimed in ~~Claim 20 or 21~~ claim 21 wherein the polymer incorporates an oleyl or other hydrophobic group.

23. (Currently Amended) A polymer-modified biological element as claimed in ~~Claim 21~~ claim 21 wherein the biological element is a baculovirus particle.

24. (Currently Amended) A process for the preparation of a polymer modified biological element as defined in ~~any one of Claims 6 to 23~~ claim 23 which process comprises combining a biological element with a polymer.

25. (Currently Amended) A polymer modified biological element obtainable by the process according to ~~Claim 25~~ claim 24.

26. (Currently Amended) A polymer modified biological element as defined in ~~any one of Claims 6 to 19~~ claim 19 for *in vivo* delivery of therapeutic genetic material to a patient, wherein the polymer modified biological element comprises a biological element which includes the therapeutic genetic material.

27. (Currently Amended) A method of gene therapy which method comprises administering to a patient in need of such therapy a polymer modified biological element as defined in ~~any one of Claims 6 to 20~~ claim 20 which includes therapeutic genetic material.

28. (Currently Amended) Use of a polymer modified biological element as defined in ~~any one of Claims 6 to 20~~ claim 20 ~~in for~~ for the manufacture of a medicament for use in gene therapy wherein the polymer modified biological element comprises a biological element which includes therapeutic genetic material.

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29. (Currently Amended) A composition comprising a polymer modified biological element as defined in ~~any one of Claims 6 to 18~~ claim 18 in association with a carrier.

30. (Currently Amended) A composition as claimed in ~~Claim 29~~ claim 29 wherein the carrier is a pharmaceutically acceptable additive, diluent or excipient.

31. (Currently Amended) Use of a polymer-modified biological element as claimed in ~~any one of Claims 20 to 23~~ claim 23 for treatment of oil pollutants or for delivery of biological pesticides to pathogens in the agricultural industry.

32. (New) A method according to claim 1, wherein the synthetic hydrophilic multivalent polymer comprises a polymer backbone based upon monomer units selected from the group consisting of N-2-hydroxypropylmethylacrylamide (HPMA), N-(2-hydroxyethyl)-1-glutamine (HEG), ethyleneglycol-oligopeptide, or dextran.

33. (New) A polymer modified biological element as claimed in claim 21 wherein the biological element is an adenovirus.